Multiobjective Optimal VAR Dispatch Using Strength Pareto Evolutionary Algorithm

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Summary

In this paper, strength Pareto evolutionary algorithm (SPEA) for optimal reactive power (VAR) dispatch problem is presented. The optimal VAR dispatch problem is formulated as a nonlinear constrained multiobjective optimization problem where the real power loss and the voltage stability are to be optimized simultaneously. The proposed approach handles the problem as a true multiobjective optimization problem. A hierarchical clustering algorithm is imposed to provide the decision maker with a representative and manageable Pareto-optimal set. Moreover, fuzzy set theory is employed to extract the best compromise solution over the tradeoff curve. The results demonstrate the capabilities of the proposed approach to generate true and well-distributed Pareto-optimal solutions of the multiobjective VAR dispatch problem in one single run. In addition, the effectiveness of the proposed approach and its potential to solve the multiobjective VAR dispatch problem are confirmed.